AES 7170 IP-Link Transceiver

(Remote & Local)

UL LISTED

Installation and Operation Manual

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1.0 Product Description: AES 7170 IP-Link System:

MultiNet is an **AES *IntelliNet*** system that uses the Internet to forward received radio signals to a central location. At the central location a MultiNet receiver is the central controller. IP-Link Transceivers are deployed in local and or remote locations to collect ***IntelliNet*** radio signals from Subscribers that are then forwarded using the Internet, local network or backup modem, to the central MultiNet Receiver for processing and distribution.

Figure A below illustrates a typical IP-Link system deployment.

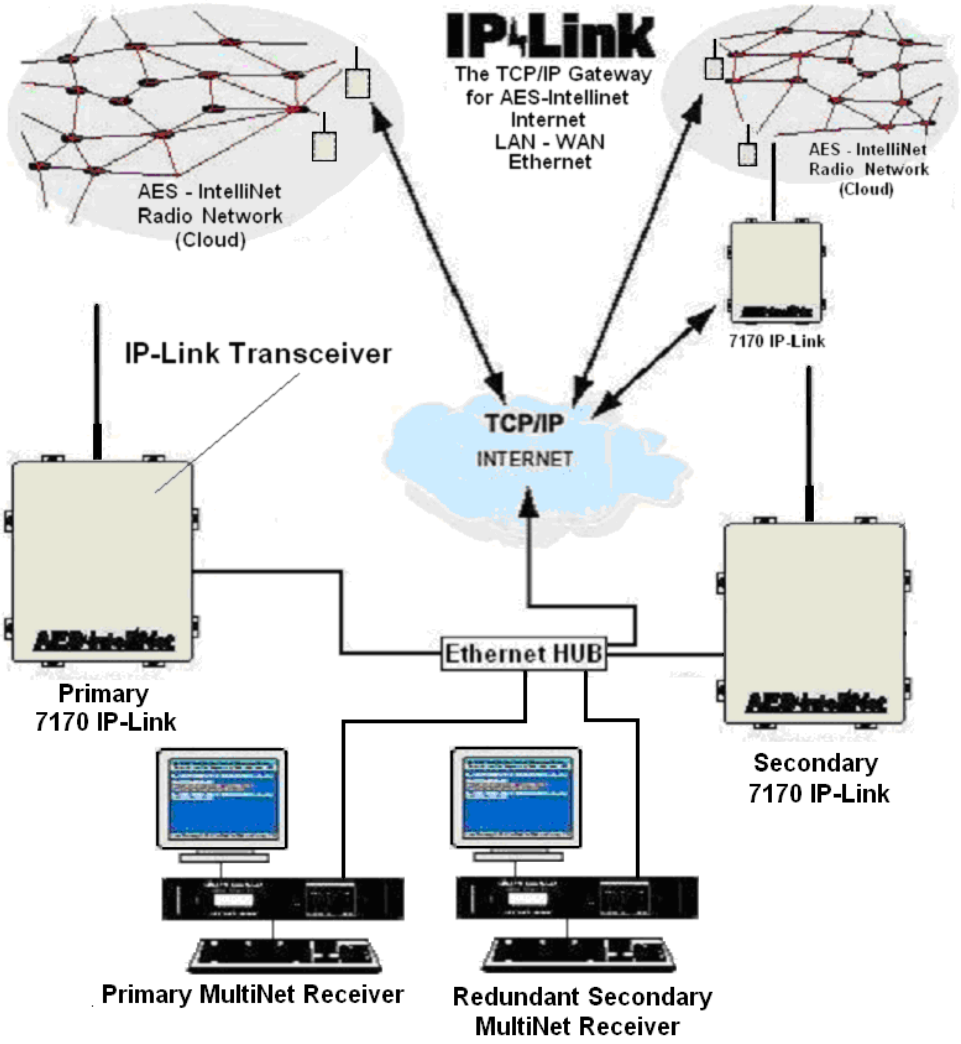


Figure A. Typical IP-Link Network Configuration

The AES 7170 IP-Link System is available in a single or dual configuration. In a dual configuration, the second IP-Link Transceiver acts as the backup. Each IP-Link Transceiver will be configured to monitor and be monitored by a MultiNet receiver. Detection of troubles and switching between primary and secondary is automatic.

This product shall be installed in accordance with NFPA 72, NEC, UL 827 and all applicable local codes

Following is a list and diagram of key components.

□

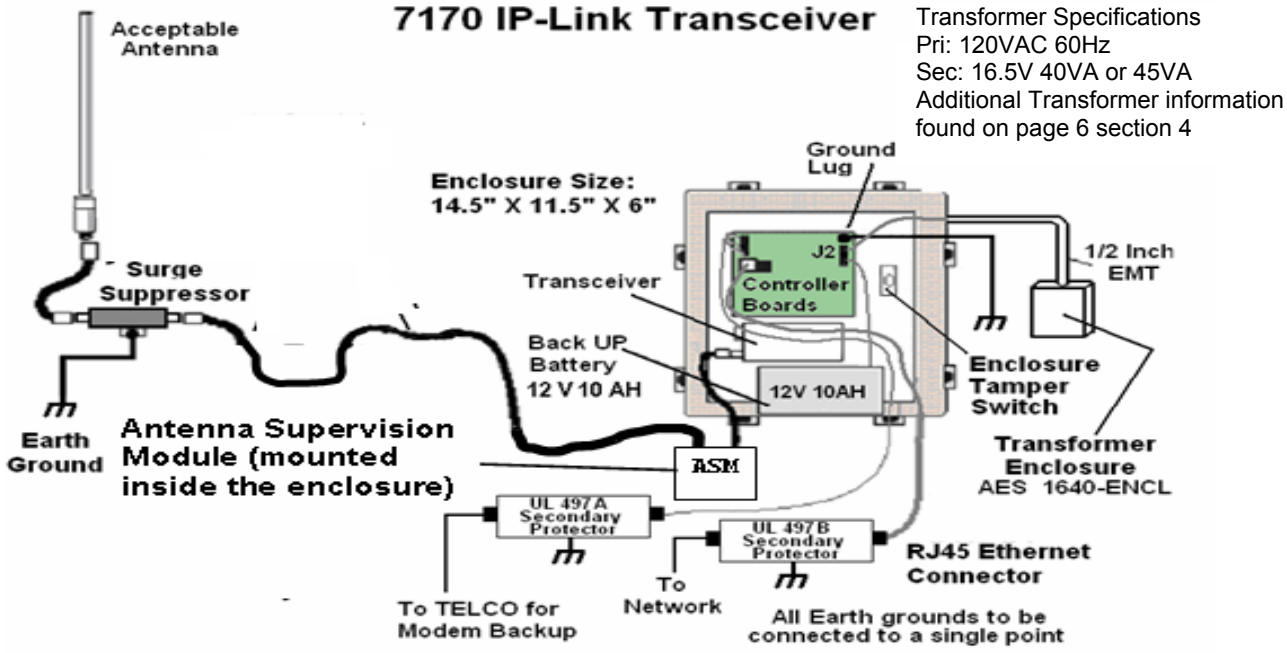


Figure B. Typical 7170 IP-Link Transceiver Installation

All wiring and installation must comply with relevant UL installation standards and local buildings codes. Transformer and its wiring must be protected in conduit and in an AES 1640-ENCL enclosure. Unit must bonded to Earth Ground via the ground lug on PCB. Customer shall be responsible for design of site-specific conduit detail including but not limited to the usage of enclosures to house the IP-Link and Surge Suppressor for the purpose of protecting transformer wiring in conduit.

A. 7170 IP-Link Transceiver:

The 7170 IP-Link Transceiver acts as a remotely installed hub or receiver that forwards all the signals received from a cluster of **AES** Subscriber Units to an **AES** MultiNet Receiver via a LAN, WAN, the Internet or a backup modem. The MultiNet receiver then forwards the signals to the appropriate system. This allows the customer to expand their geographical market reach without direct radio connectivity to the Central Station Receiver. For AES customers with busy networks, the MultiNet system provides significantly increased capacity for their ***IntelliNet*** system without adding a new frequency. It also allows adding a new frequency to a RF congested area.

It is housed in a rugged NEMA style enclosure for positioning near the antenna. This assures minimal RF loss from longer coaxial cables. A battery for backup is located in the same enclosure. The battery powers the IP-Link Transceiver in event of a power failure. It also, more efficiently provides extra current the transceiver needs when transmitting. As with any AES central station receiver a Surge Suppressor is recommended. Flanges are provided for wall mounting. Approximate enclosure size is 14”h x 11.5” w x 6”d.

B. ASM Antenna Supervision Module (7170SWR)

This module is placed in series with the RF connection between the transceiver and the antenna connector and allow the detection of antenna cut by measuring the SWR. It is powered from the board stack. When the antenna is cut, it issues a signal to the board stack that process it and issues a message to the Multinet Receiver. Upon antenna reconnection, a restoral is issue after a pre-defined time has been elapsed without any detection of antenna cut.

C. Antenna(s):

Rugged large antenna to maximize the range of the Base station IP-Link Transceiver. Size and gain vary according the installation requirements and radio frequency. Typical size for a UHF antenna is approximately 8 feet in height, with 9db gain. The use of High Gain Antennas is approved for use in a UL installation or for NFPA 72 compliance.

D. Cables and connectors:

Low-Loss RG-8 (Belden 9913 type) coax cable is supplied with appropriate "N- Type" connectors for maximum performance.

E. AES 52-0054 Surge Suppressor(s):

A device installed in the coaxial transmission line to help protect components and structure against surges like those produced by lightning. The device dissipates surges to an earth ground that is connected to the devices' mounting bracket. Use only AES part.

F. Internal Modem:

IP-Link's are equipped with an internal Modem for backup communication when TCP/IP communication is delayed or unavailable. During the IP-Link's initialization process the modem is tested using both programmed phone numbers. During those tests the Modem LED will be on and the Console Port unavailable. If either number fails to connect to an assigned MultiNet Receiver, it will be re-tested randomly every 5 to 10 minutes until it passes or the maximum number of 5 attempts is reached.

If during normal operation TCP/IP heartbeat fails, the IP-Link's RF goes offline transmitting a "Receiver Not in Service" message. That message will notify other IntelliNet devices to select a secondary IP-Link for communicating. The modem is again tested, and if it passes any stored messages are passed to the MultiNet receiver and RF goes back online by transmitting a "Receiver Ready" message. Until the TCP/IP connection returns satisfactorily, communication to the MultiNet receiver will occur using the modem. Sending of Alarm messages via modem are attempted immediately after reception. All other less significant messages may be discarded.

The modem, using both phone numbers is tested daily. Interval between daily test attempts is 24 hours plus a random number of minutes up to 30, after the preceding tests pass. This means that the time of day that the daily modem tests occur, randomly advance. This helps to spread out multiple IP-Link testing.

G. Typical Unique Installation Tool Requirements:

The primary tools required to install an IP-Link Transceiver are as follows.

Power or SWR Meter	Large Wire Cutters	Weatherproof Tape
Coax Connector Crimping Tool	RG-8U Coax Strippers	
Serial Terminal or PC running a terminal program		Silicon Sealant

2.0 Safety Considerations:

The following items are safety related precautions that you should take into consideration when installing your AES IntelliNet system. They are for your safety as well as others and the safety of your equipment.

- Use caution when installing antennas to keep them away from electrical wires which could cause serious injury or death if antenna makes contact with live wires.
- All equipment must be installed in accordance with National Electric Code, applicable UL Standards and local building codes.
- Be certain to properly ground the antenna and surge suppressor to help dissipate surges away from equipment and personnel. The grounding of the antenna and surge suppressor is for your safety and the safety of your equipment and should not be neglected.

3.0 Environmental Considerations:

The following environmental related suggestions are to help insure an installation that will provide you with a system that will operate at its optimum long into the future.

- The provided AES 52-0054 surge suppressor should be installed in a weather tight enclosure such as a UL Listed NEMA4 enclosure.

4.0 Technical Specifications:

Listed below are the technical specifications for the 7170 IP-Link Transceiver.

- Transformer Input rating is 16.5 Volts AC at 40/45VA – Use only provided Model Amseco XF-1640 or ELK P/N ELK-TRG1640 or TDC Power P/N DA-40-16.5 or MG Electronics P/N MGT1640
- DC Current Draw: 370mA standby, 900mA transmit
- 7170 DC operating voltage is 12 Volts nominal.
- Onboard Fuse; Self Resetting / Not User Serviceable
- Rechargeable Gel Type Battery Required: 12V, 10AH
- Low Battery Condition, AC Fail and Charger Trouble are reported to Central Station.

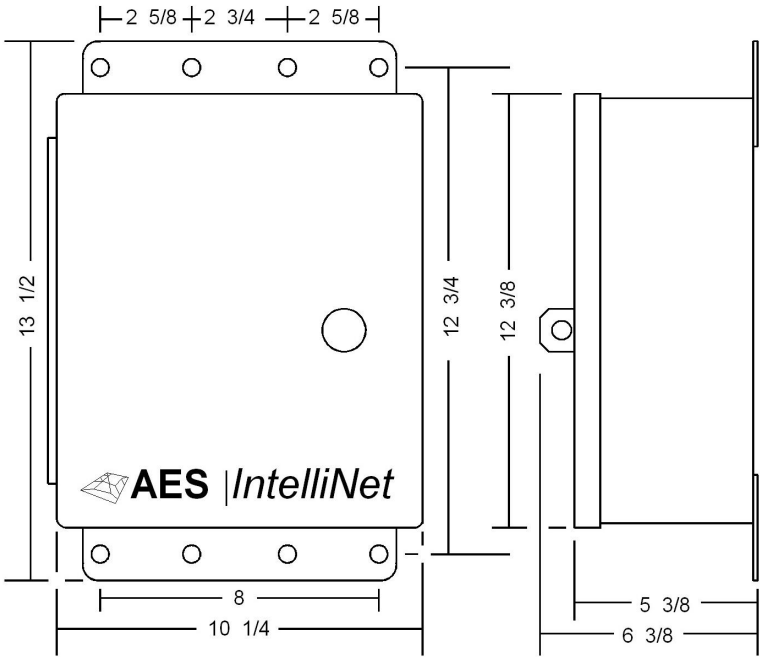


Figure C – Enclosure Dimensions

5.0 Installation:

The IP-Link Transceiver installation site is a critical element of the **AES *IntelliNet*** network. Every installation is unique, taking into account structure, geography and other factors. This section covers elements of the system installation and operation. Read the entire document before proceeding with your installation.

- Read the Manual and any other provided documents.
- Study each component to understand its mounting and installation characteristics.
- Decide how each component be will be installed in your facility.
- Proceed with the installation in a manner that serves your needs best.
- Test your installation as outlined in section 8.

A. 7170 IP-Link Transceiver Enclosure Mounting:

Mount the enclosure on a steady permanent surface. A plywood backboard attached to a wall works well. Locate it so that the coax runs to the antenna without tight bending, kinking or producing strain on the coax and its connectors. Use mounting hardware of appropriate size to support the weight of the enclosure.

B. Antenna:

It is a requirement in a commercial operation when growing a network to cover a large area. For a professional installation, you can install the major components, run the required cables, and then retain a qualified radio technician to perform the RF portion of the installation:

1- Antenna, Mounts and connectors
2- All RF Connectors /Terminations
3- RF Lightning Suppressor / Grounding
4- Final check to assure that your installation is getting maximum performance.

Contact the radio technician BEFORE you begin any part of the installation, which is a mix of science and art. Radio signal distance is in part related to the height of the antenna. Select an antenna height that clears all or as many obstructions as possible. If mounting on the side of a metal tower you should try to place the antenna at least 5 feet off the tower if possible, with 2 ½ feet off the tower as the absolute minimum.

C. Coaxial Cabling and Connections:

The length of the coaxial cable is important. Coax causes loss of signal, the longer the coax the greater the loss. You do not want to sacrifice signal loss for antenna height that

is not necessary. Ideally, select an antenna height and the 7170 IP-Link Transceiver location that will use less than 50 feet of coax. If you must exceed 50 feet absolutely do not exceed 100 feet unless you use a lower loss cable than provided with the standard system. AES provides a Belden 9913 or equivalent which is a lower loss cable than standard RG-8/U. 9913 is specified as about 3 dB per 100 feet at 400 MHz, which means a loss of 50% of power in 100 feet of coax.

1- Terminate the 9913 N-Type connectors at the coax ends that connect to the antenna, and the surge suppressor, (if applicable, make sure it faces the right direction) and to the 7170 IP-Link Transceiver. AES pre-installs one connector on the provided spool of coax. Route or pull your coax such that this connector connects to the base of the antenna if possible.

2- Run the ground cable from surge suppressor to a suitable earth ground in accordance with the local building codes.

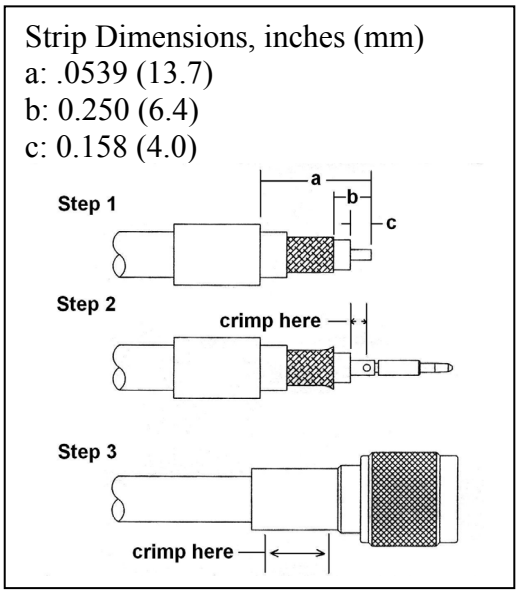


Figure E – Crimp Style N Connector

Installation of Crimp Style N-Type connectors:

Step 1 Strip cable jacket, braid, and dielectric to dimensions shown. All cuts are to be sharp and square. **Important:** Do not nick braid, dielectric, and center conductor. Tinning of center conductor is not necessary if contact is to be crimped. For solder method, tin center conductor avoiding excessive heat.

Step 2 Slide outer ferrule onto cable as shown. Flare slightly end of cable braid as shown to facilitate insertion of inner ferrule. **Important:** Do not comb out braid. Place contact on cable center conductor so it butts against cable dielectric. Center conductor should be visible through inspection hole in contact. Crimp or solder contact in place as follows:

Crimp Method: Use Die Set Cavity for contact indicated in table above.

Solder Method: Soft solder contact to cable center conductor. Do not get any solder on outside surface of contact. Avoid excessive heat to prevent swelling of dielectric.

Step 3 Install cable assembly into body assembly so inner ferrule portion slides under braid, Push cable assembly forward until contact snaps into place in insulator. Slide outer ferrule over braid and up against connector body. Crimp outer ferrule using Die Set Cavity specified in table above.

Installation of Clamp Style N-Type connectors:

This style connector is no longer provided by AES. The illustration is provided in case you come across one.

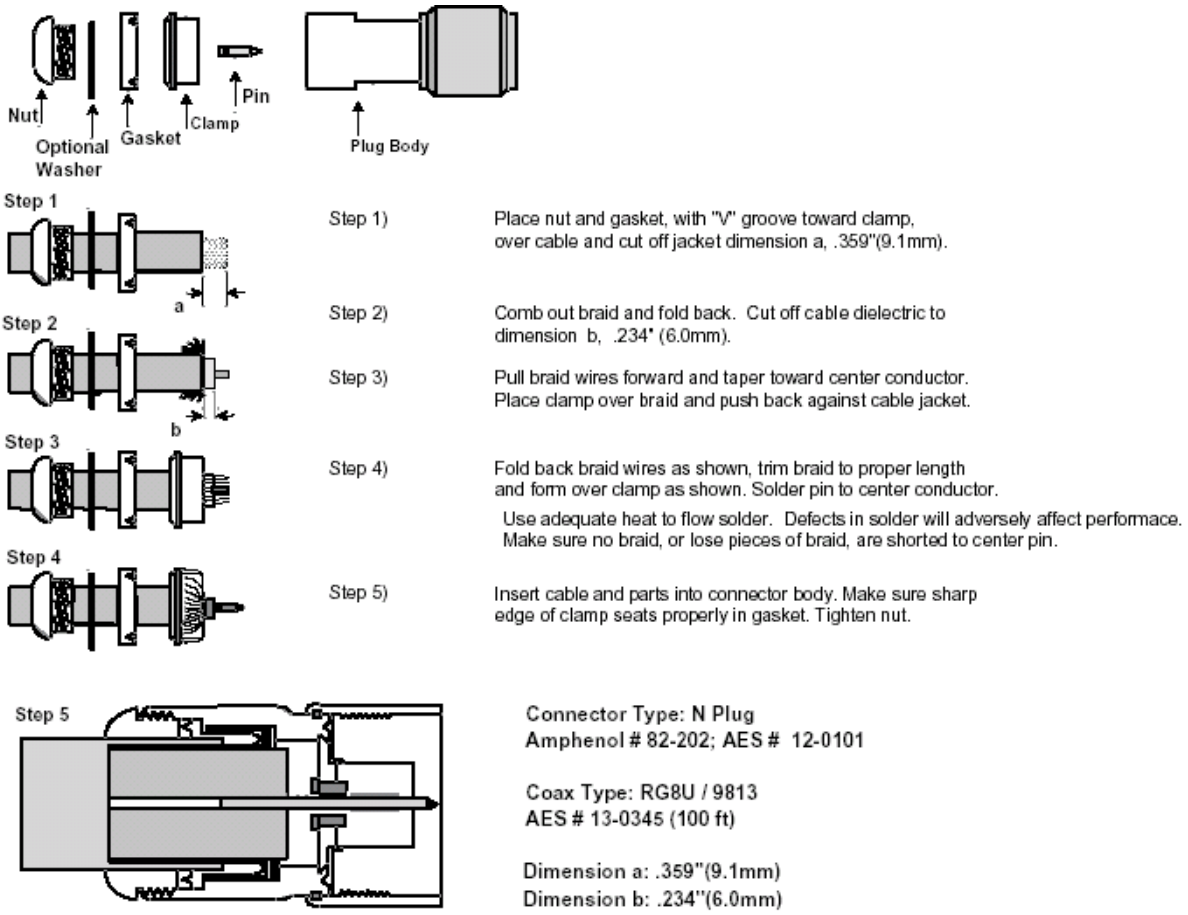

Nut
Optional Washer
Gasket
Clamp
Pin
Plug Body
Step 1
a
Step 2
b
Step 3
Step 4
Step 5
Step 1) Place nut and gasket, with "V" groove toward clamp, over cable and cut off jacket dimension a, .359"(9.1mm).
Step 2) Comb out braid and fold back. Cut off cable dielectric to dimension b, .234" (6.0mm).
Step 3) Pull braid wires forward and taper toward center conductor. Place clamp over braid and push back against cable jacket.
Step 4) Fold back braid wires as shown, trim braid to proper length and form over clamp as shown. Solder pin to center conductor.
Use adequate heat to flow solder. Defects in solder will adversely affect performace.
Make sure no braid, or lose pieces of braid, are shorted to center pin.
Step 5) Insert cable and parts into connector body. Make sure sharp edge of clamp seats properly in gasket. Tighten nut.
Connector Type: N Plug
Amphenol # 82-202; AES # 12-0101
Coax Type: RG8U / 9813
AES # 13-0345 (100 ft)
Dimension a: .359"(9.1mm)
Dimension b: .234"(6.0mm)

Figure F – Solder Type N Connector

D. Surge Suppressor:

Install the Surge Suppressor in the coaxial transmission line outside to help keep surges from entering the building. We recommend installing it in a user provided weather tight enclosure or seal it from moisture with user provided sealant or weather sealing tape such as self-fusing tape.

E. Grounding:

Attach a good earth ground to the surge suppressor and the antenna mounting bracket(s). The grounding of the antenna and surge suppressor is for your safety and the safety of your equipment and should not be neglected.

6.0 Wiring (Electrical Inputs and Outputs):

Listed below are the termination points and connectors in the IP-Link Transceiver. Each connection is described in detail. All connections need to be completed before the IP-Link Transceiver will be fully functional.

Connections on the Interface Board. This is the 2nd board up from the bottom.

J2 (16.5VAC) – AC Input. Attach the provided 16.5 VAC 40/45 VA source to this terminal. Use min. 18 Ga., wiring between transformer and J2 AC Input.

Telephone – Attach to the phone system for proper line seizure functionality via an RJ-31X jack, using minimum 26 AWG wire. This is used for modem backup communication to IP-Link Server. This line must be protected with a UL Listed 497A Secondary Protector. The modem feature has not been evaluated by UL.

Ethernet Jack – Attach to the LAN or WAN that connects to the IP-Link Server. Use standard CAT-5 Ethernet cable. This line must be protected with a UL Listed 497B Secondary Protector.

Console Port – dB-9 Serial port used to program and configure the IP-Link's parameters. Use standard serial cable appropriate for terminal being used.

Connections on Radio Control Board. This is the bottom Board. It is an AES 7001 PCB.

Radio Transceiver Cable – Connect the dB-9 male connector on the end of this cable to the dB-9 female connector on the radio transceiver.

No other user connections are required on this board.

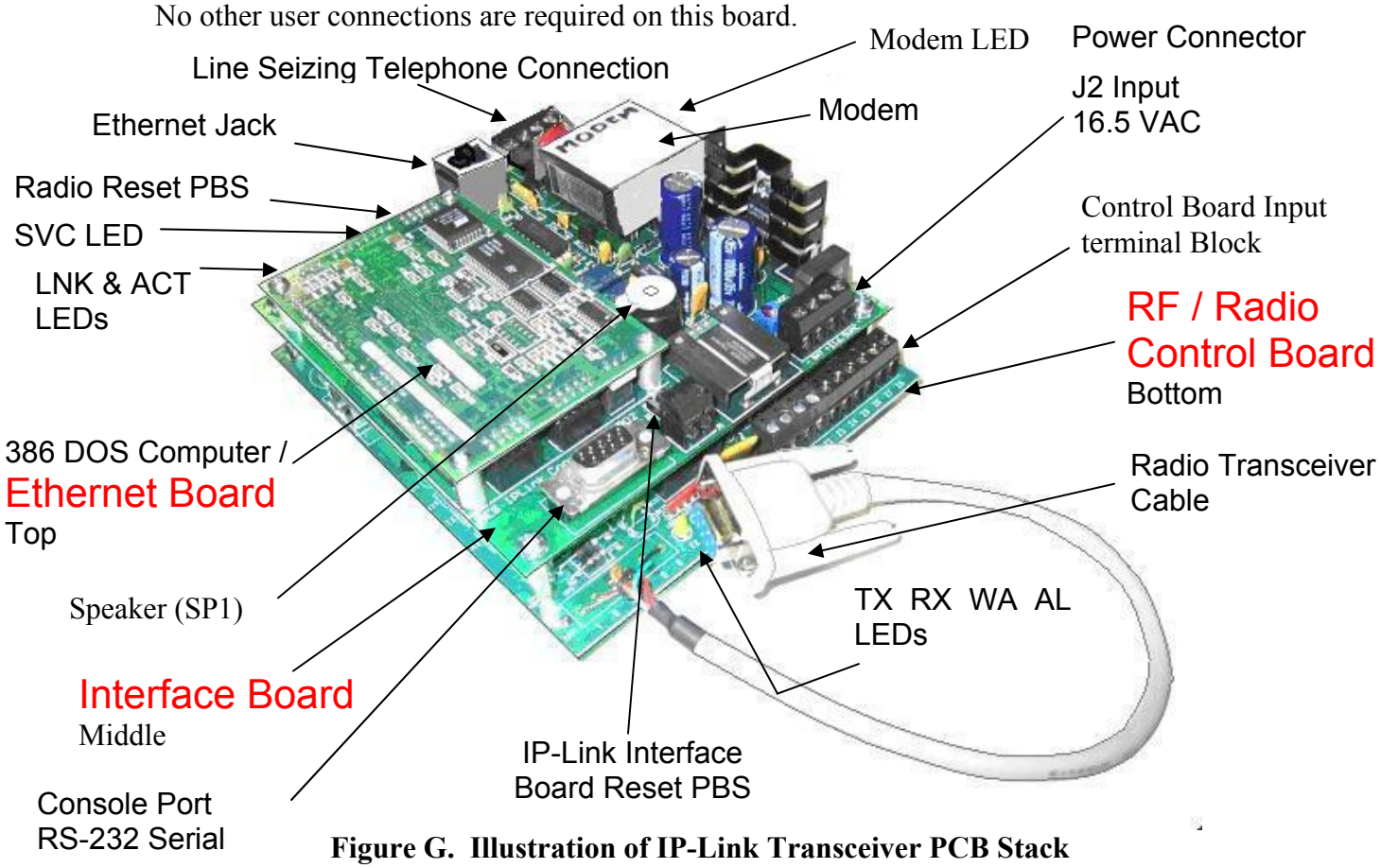


Figure G. Illustration of IP-Link Transceiver PCB Stack

NOTE: DO NOT POWER UP THE IP-LINK TRANSCEIVER UNTIL ITS MULTINET RECEIVER IS ON-LINE AND READY FOR THIS UNIT TO ATTEMPT TO CONNECT.

A. Enclosure Label, Inside Cover: Below is an illustration of the label that is adhered to the inside of the cover.

Notes and example connection details are included.

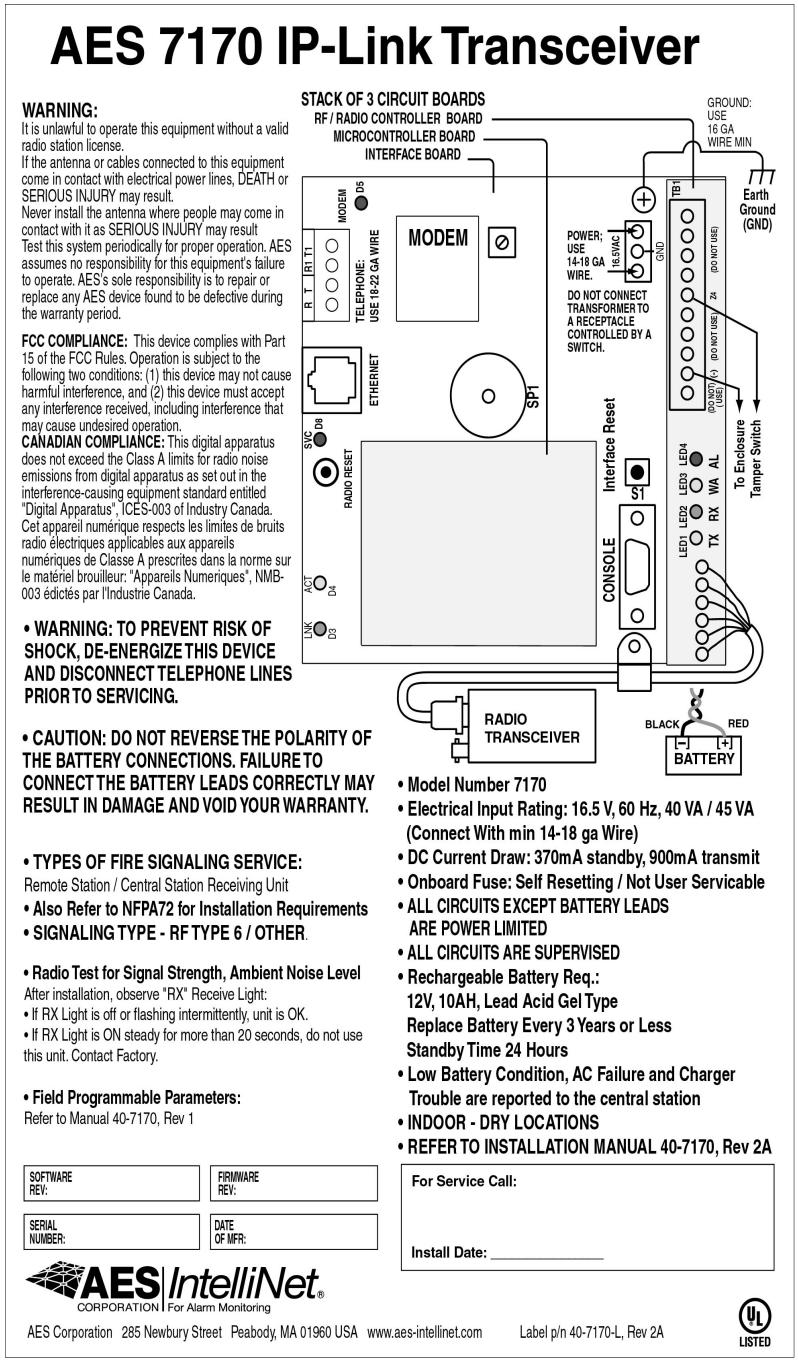
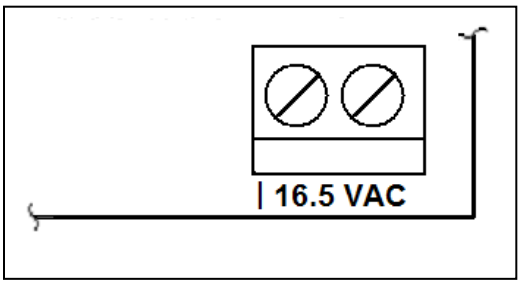

AES 7170 IP-Link Transceiver
WARNING:
It is unlawful to operate this equipment without a valid radio station license.
If the antenna or cables connected to this equipment come in contact with electrical power lines, DEATH or SERIOUS INJURY may result.
Never install the antenna where people may come in contact with it as SERIOUS INJURY may result
Test this system periodically for proper operation. AES assumes no responsibility for this equipment's failure to operate. AES's sole responsibility is to repair or replace any AES device found to be defective during the warranty period.
FCC COMPLIANCE: This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
CANADIAN COMPLIANCE: This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus", ICES-003 of Industry Canada.
Cet appareil numérique respects les limites de bruits radio électriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: "Appareils Numeriques", NMB-003 édictés par l'Industrie Canada.
• WARNING: TO PREVENT RISK OF SHOCK, DE-ENERGIZE THIS DEVICE AND DISCONNECT TELEPHONE LINES PRIOR TO SERVICING.
• CAUTION: DO NOT REVERSE THE POLARITY OF THE BATTERY CONNECTIONS. FAILURE TO CONNECT THE BATTERY LEADS CORRECTLY MAY RESULT IN DAMAGE AND VOID YOUR WARRANTY.
• TYPES OF FIRE SIGNALING SERVICE:
Remote Station / Central Station Receiving Unit
• Also Refer to NFPA72 for Installation Requirements
• SIGNALING TYPE - RF TYPE 6 / OTHER.
• Radio Test for Signal Strength, Ambient Noise Level
After installation, observe "RX" Receive Light:
• If RX Light is off or flashing intermittently, unit is OK.
• If RX Light is ON steady for more than 20 seconds, do not use this unit. Contact Factory.
• Field Programmable Parameters:
Refer to Manual 40-7170, Rev 1
STACK OF 3 CIRCUIT BOARDS
RF / RADIO CONTROLLER BOARD
MICROCONTROLLER BOARD
INTERFACE BOARD
GROUND: USE 16 GA WIRE MIN
Earth Ground (GND)
MODEM
D5
TELEPHONE: USE 18-22 GA WIRE
R T R1 T1
ETHERNET
POWER; USE 14-18 GA WIRE.
16.5VAC
GND
DO NOT CONNECT TRANSFORMER TO A RECEPTACLE CONTROLLED BY A SWITCH.
TB1
(DO NOT USE)
2t
(DO NOT USE)
(DO NOT USE)
SPT
SVC D8
RADIO RESET
ACT D4
LINK D3
Interface Reset
S1
CONSOLE
LED4 AL
LED3 WA
LED2 RX
LED1 TX
To Enclosure Tamper Switch
RADIO TRANSCEIVER
BLACK
RED
BATTERY
• Model Number 7170
• Electrical Input Rating: 16.5 V, 60 Hz, 40 VA / 45 VA (Connect With min 14-18 ga Wire)
• DC Current Draw: 370mA standby, 900mA transmit
• Onboard Fuse: Self Resetting / Not User Servicable
• ALL CIRCUITS EXCEPT BATTERY LEADS ARE POWER LIMITED
• ALL CIRCUITS ARE SUPERVISED
• Rechargeable Battery Req.:
12V, 10AH, Lead Acid Gel Type
Replace Battery Every 3 Years or Less
Standby Time 24 Hours
• Low Battery Condition, AC Failure and Charger Trouble are reported to the central station
• INDOOR - DRY LOCATIONS
• REFER TO INSTALLATION MANUAL 40-7170, Rev 2A
SOFTWARE REV:
FIRMWARE REV:
SERIAL NUMBER:
DATE OF MFR:
For Service Call:
Install Date: _____
AES IntelliNet
CORPORATION For Alarm Monitoring
AES Corporation 285 Newbury Street Peabody, MA 01960 USA www.aes-intellinet.com
Label p/n 40-7170-L, Rev 2A
LISTED

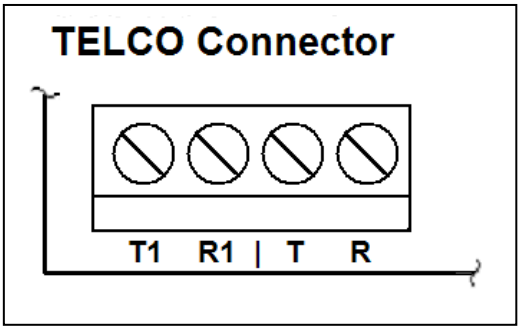
Figure H. Enclosure Inside Door Label

B. Terminal Block Connection Details:



The terminal designations for the Power Connector terminal block are shown in the diagram to the right. Connect your 16.5 VAC transformer to the designated terminals. **DO NOT apply power to these until the MultiNet Receiver is set up and you are ready to proceed with configuration of this Unit.**

Figure I. Power Connector



The terminal designations for the Telephone (TELCO) Connector terminal block are shown in the diagram to the right. These terminals should be properly connected to an RJ-31X phone jack to allow for proper line seizer functions. Refer to telephone company documentation. T and R are to Tip and Ring of phone line. T1 and R1 are for Tip and Ring to premise telephones, if any.

Figure J. Telephone Connection

UL Installation Note: When connecting the 7170 IP-Link Transceiver's modem to a telephone line, a UL Listed 497A Secondary Protector is required to be installed on the incoming lines. Installation shall be in accordance with the NEC Article 800, the manufactures installation instructions and in accordance with all local codes.

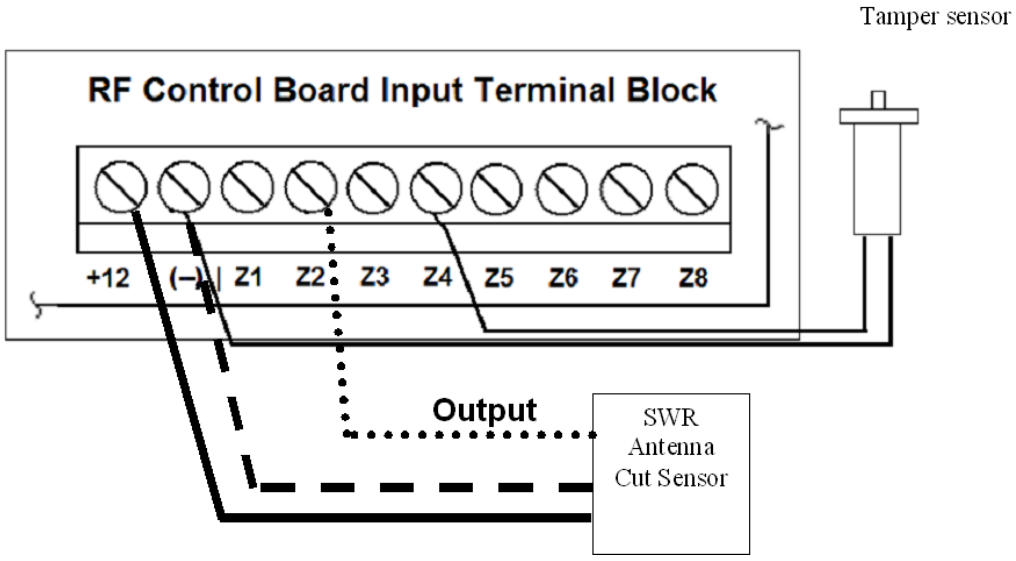


Figure K. RF Control Board, Input terminal Block

The terminal designations for the RF / Radio Controller Board Connector terminal block are shown in the diagram above. Use only UL listed 26AWG minimum wire.

The factory installed Enclosure Tamper Switch is connected to terminals (-) and Z4 as shown. DO NOT USE, **Z1, Z3,** AND **Z5** THRU **Z8** as indicated on label.

7.0 Indicators:

There are several LED indicators and one speaker in the IP-Link transceiver. Below are descriptions of their functions.

A. Interface Board LEDs and Speaker:

SVC (Red LED) – This LED is to indicate the status of the connection to the MultiNet receiver it is configured to communicate with. If the LED is on then the heartbeat signal that is sent to the MultiNet Receiver is receiving the proper response in return. If the LED is off, then the IP-Link Transceiver is not receiving the proper acknowledge message back in return to it's heartbeat signal and the IP-Link is offline.

LNK + ACT (Green & Yellow LEDs) – These LEDs are for indicating the status of the Ethernet link. The LNK LED indicates the status of the Ethernet. When illuminated, the Ethernet port is receiving the Ethernet 'heartbeat' and is connected to a live network. If this LED is not illuminated, there is a problem with the Ethernet wiring or the network. The ACT LED indicates activity on the network. The LED will flash when a data packet is received or transmitted.

Modem (Red LED) – This LED indicates which serial device is switched to the available serial port. There is one serial port that is shared between the Console Port and the Modem. Only one device can be attached at a time. When the program wants to use the modem it switches the serial port from the Console Port connector to the on-board modem. When this LED is on the modem can be used. When it is off the Console port is active. For this reason, if the port is switched to the Modem in order for the processor to perform communication or modem test functions, commands sent to the serial port through the Console Port Connector, may not get received or cause a response.

Modem Testing and availability of Console Port: During the IP-Link's initialization process the modem is tested using both programmed phone numbers. During those tests the Modem LED will be on and the Console Port is unavailable. If there is no active phone line attached, testing may take a prolonged period of time during which the Console Port will be unavailable.

Speaker (SP1) – The speaker is controlled by the modem and is used to monitor / troubleshoot the telephone connection. Dial tone, dialing and connection tones can be heard while the IP-Link attempts to connect with the designated MultiNet receiver.

B. RF / Radio Control Board LEDs:

These LEDs are the status indicators for the various states and functions of the Controller board.

TX (Yellow LED) – This LED indicates that the radio is transmitting.

RX (Green LED) – This LED indicates that the radio is detecting an RF transmission. If the IP-Link's radio receiver is subject to RF Interference, this LED will illuminate steady on and remain on for more than 20 seconds. See page 19 "RF Interference".

WA (Yellow LED) – A steady on indicates that a radio packet transmission has been attempted and the controller is waiting for an acknowledgement. Blinking indicates the RF communication is off the network. Off is a normal indication.

AL (Red LED) – This LED is a status / Troubleshooting indicator. It is currently not in use and is usually on. This LED can be ignored.

IF THE 7005I MultiNet Receiver IS NOT CONFIGURED AND ONLINE READY TO ACCEPT SIGNALS FROM THIS UNIT,

THEN STOP!

Install and configure the MultiNet receiver First!

Then Continue Here

8.0 Programming and Setup of the 7170 IP-Link Transceiver:

NOTICE TO USERS, INSTALLERS, AUTHORITIES HAVING JURISDICTION, AND OTHER INVOLVED PARTIES

This product incorporates field-programmable software. In order for the product to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864, certain programming features or options must be limited to specific values or not used at all as indicated below.

Program Feature or Option	Permitted in UL 864 (Y/N)	Possible functional settings	Settings permitted in UL 864
TCP/IP Socket timeout	Y	12-30	12
Link Layer	Y	0-254	Primary IP-Link= 1 Secondary IP-Link = 1 Others IP-Links = 1 not higher than 4
ACK Mode	Y	0/Normal – 1/Quick	Only 1 IP-Link in a Cloud Set to 1/Quick
PinG	Y	Yes / No	Yes

To configure the IP-Link Transceiver you communicate with it via the Console Serial Port. Use a serial terminal program like Telix or Hyper Terminal (included with Windows) to configure the IP-Link Transceiver. Using this software allows you to send ASCII character instructions and view the response on the terminal's display.

The IP-Link Transceiver has a built in 386 DOS computer with 10BASE-T Ethernet Port incorporated into the system. Configuring the IP-Link Transceiver includes editing data files that contain ASCII text strings of parameters. Once you have connected to the Console port with a terminal program you can reset the unit and be presented with an option to go to a terminal mode where you will get a familiar DOS style prompt. Commands can be entered at this prompt. An included DOS line editor is used to edit the configuration files.

A. Communicating with the 7170 IP-Link Transceiver:

Listed below are instructions for configuring several terminal emulation programs. These programs can be used to directly communicate with the IP-Link Transceiver via the Console port to edit essential configuration files.

A.1. Configure Hyper Terminal (in Windows) to communicate with the 7170:

1. In Windows Click on Start, Programs, Accessories, Communications and then Hyper Terminal.
2. Enter a name and choose an icon for this connection. IP-Link would be a good choice for a name that you would recognize in the future when needed. Select an icon for the connection and then select OK.

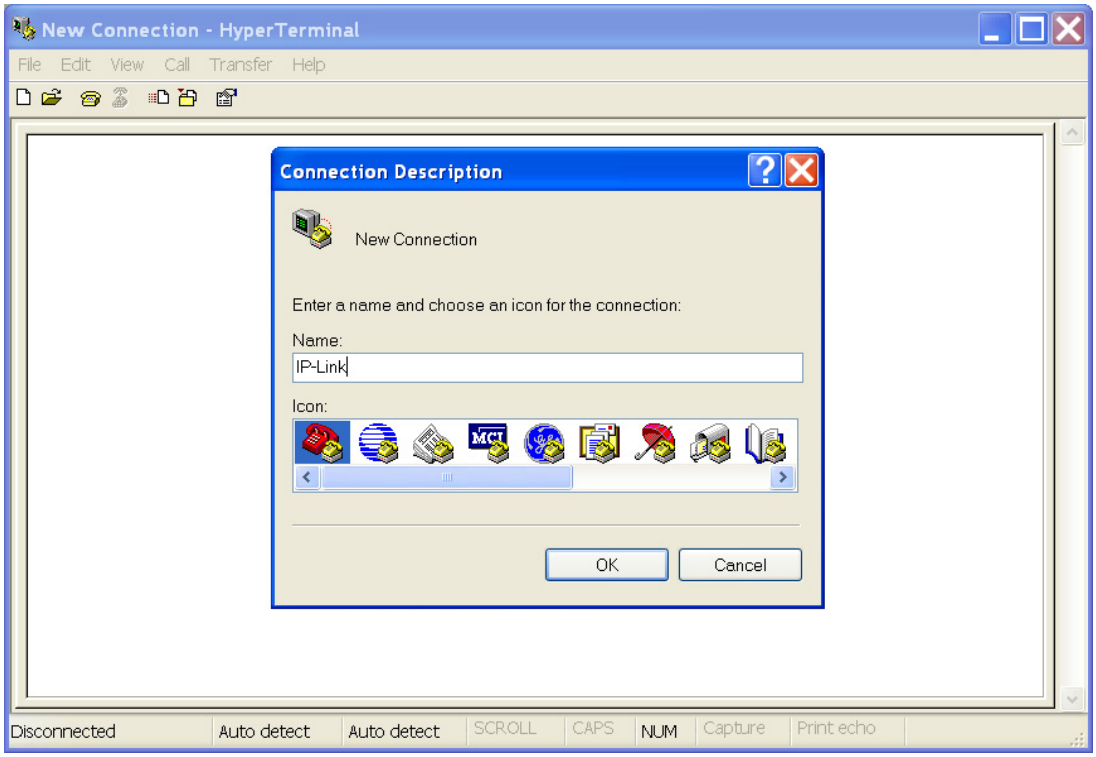


Figure L – HyperTerminal - Connection Description

3. Do Not enter any Details for the Country/region, Area code or Phone number. Instead just pull down the “Connect using” and choose your available free Com Port and select OK.
4. Under the Connect using select the Com port that you will be using.

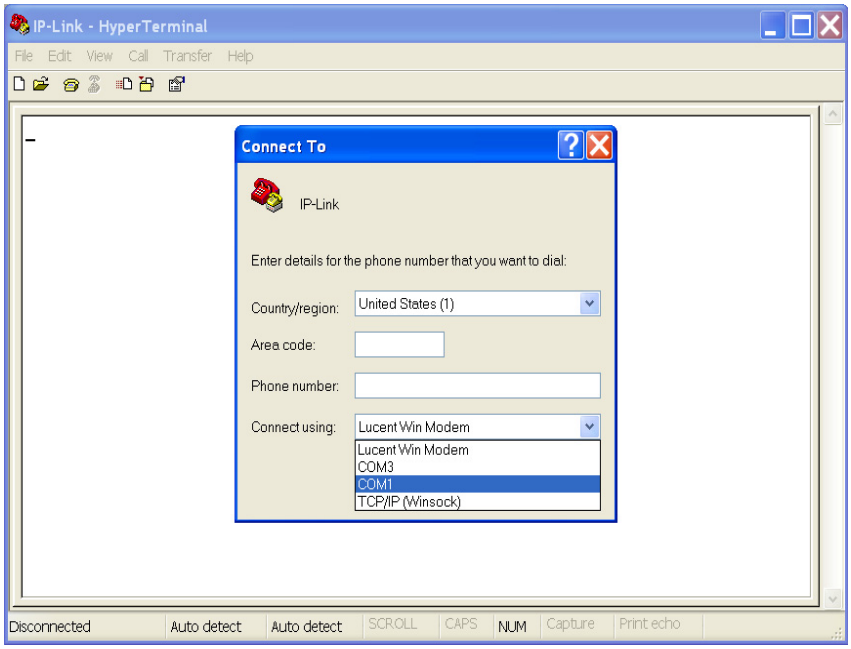


Figure M – HyperTerminal - Connect To

5. Under Port Settings change “Bits per second” to 19200. Other settings are “Data bits:” 8, “Parity:” None, “Stop bits:” 1, “Flow control:” is Hardware then OK.

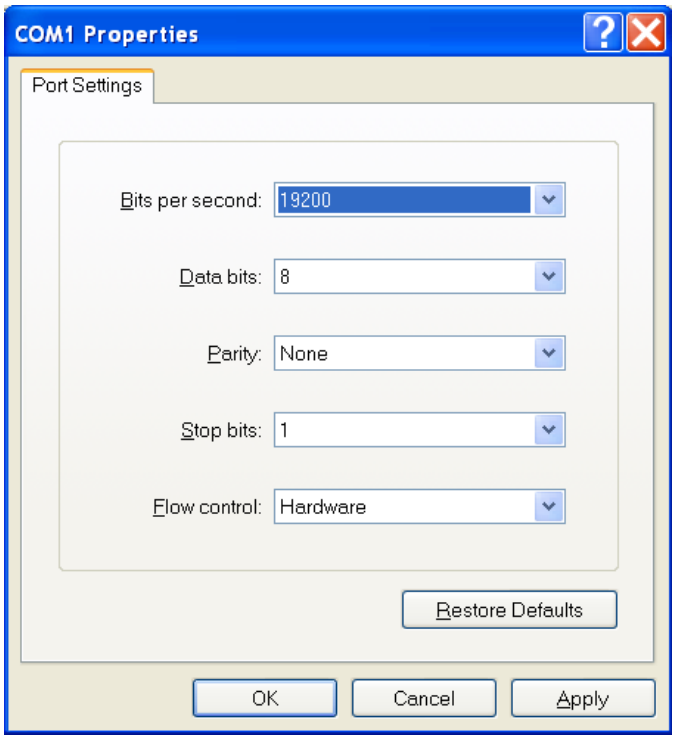


Figure N – HyperTerminal - COM Properties

6. You are now ready to use HyperTerminal.

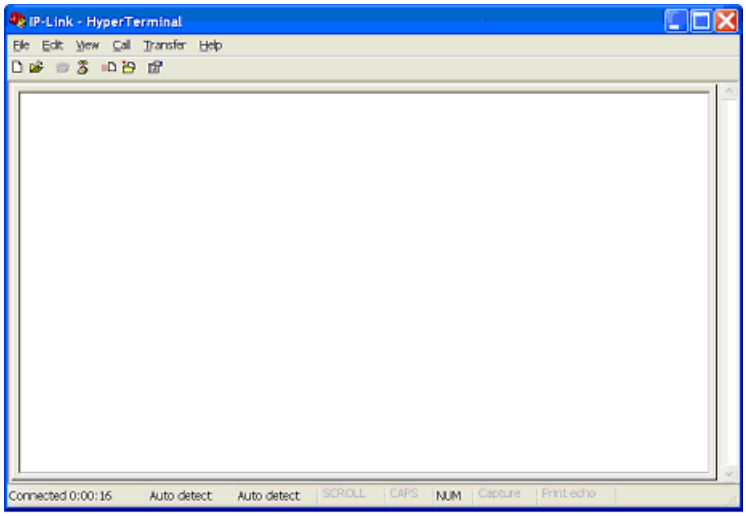

IP-Link - HyperTerminal
File Edit View Call Transfer Help
Connected 0:00:16 Auto detect Auto detect SCROLL CAPS NUM Capture Print echo

Figure O – HyperTerminal

A.2. Optionally, Configure Telix (in DOS) to communicate with the 7170:

1. Locate and start the Telix program. Example: (assuming Telex.exe is in C:\Telix) CD\Telix<Enter> then Telix<Enter>.
2. Pres <Alt> P to bring up the Com Parameters window.
3. Change communication parameters to 19200,N,8,1,COM<X> where COM<X> is the COM port you are connected to. Press <F> then <O> to set communication parameters. Press the number corresponding to the COM Port then press <Enter> to set Com port and exit parameters window.

4. Press <Alt> T to change or check terminal emulation mode. Next select (highlight) “ANSI”. Press <Enter> to return to display window.

B. Initializing the 7170 IP-Link Transceiver:

Once your terminal program is ready (see previous pages), the 7705i MultiNet Receiver is on-line and your 7170 IP-Link Transceiver is installed and wired, you are ready to power up the 7170 IP-Link Transceiver and begin the configuration.

1. Confirm that an RS 232 Cable is connected between the serial input of the 7170 “Console” and the COM port of your PC running a terminal program.
2. Confirm that the RJ45 Ethernet Cable is connected between your LAN or WAN Network and the Ethernet jack on the IP-Link Transceiver.
3. Confirm that the Phone line is connected to the Phone Line jack on the 7170.
4. Connect the Battery in the IP-Link Transceiver.
5. Energize AC Power connected to the IP-Link Transceiver at J2.
6. Once powered up, startup messages should be displayed on your terminal program screen.

   During the startup process and when prompted with:
   “Note: For Initial Config Type X then” and before the prompt:
   “Type **S**etup Key…”, press the "X" key to Halt the startup process and access the Terminal prompt. If the 7170 is already powered, press the Reset button on IP-Link Interface board (Middle board) to initialize, then press "X" to get to terminal prompt.
   See Example 1: Startup Messages.

   Another option available during startup, shortly after the prompt
   “Note: For Initial Config Type X then” and following the prompt
   “Type **S**etup Key…” is to press the “S” key. This will access the Setup Menu, which will be discussed later in section C.3. An option within the Setup Menu is to reset the IP-Link, which has up to a 70 second delay.

   X = Halt, go to terminal prompt
   S = Setup Menu
   <No key> = Proceed with Normal Operation

Notes on the Shared Serial Port:

As noted elsewhere in this manual, the Console Port and the Modem share a single Serial interface. The sharing will not begin until the startup process is allowed to continue beyond the prompt “Type **S**etup Key…”. Pressing “X” or “S” when prompted will interrupt the startup process and the port will be available for Console use or Setup Menu access respectively. Once past this point, sharing is occurring. If the Modem LED is on, the serial port is switched to the modem and any attached terminal program will have no affect. For this reason, commands sent to the serial port may not get received or cause any response

If there is no active phone line attached, testing may take an extended period of time while it tries all possibilities, during which the Console Port will be unavailable.

If the Port is switched to Console (Modem LED off) then the S<Enter> option should be available.

RF Interference

If the IP-Link's radio receiver is subject to RF Interference, the "RX" LED will illuminate and remain on for more than 20 seconds. The IP-Link should not be installed in this location until the source of the interference is cleared. Intermittent on and off of the RX LED is normal operation.

```
Bios Version 3.3c for uFlashTCP with NE2000 Ethernet
DOC Socket Services - Version 0.2
(C) Copyright 1992-1996, M-Systems Ltd.

TrueFFS-BIOS -- Version 3.3.9 for DiskOnChip 2000 (V4.2)
Copyright (C) M-Systems, 1992-2000

DOS Version 3.3c for JK microsystems Flashlite
(C) HBS Corp and JK microsystems 1991-1999

Packet driver for NE2000, version 11.4.3
Packet driver skeleton copyright 1988-93, Crynwr Software.
This program is freely copyable; source must be available; NO WARRANTY.
See the file COPYING.DOC for details; send FAX to +1-315-268-9201 for a copy.

System: [345]86 processor, ISA bus, Two 8259s
Packet driver software interrupt is 0x60 (96)
Interrupt number 0x9 (9)
I/O port 0x300 (768)
My Ethernet address is 00:90:C2:40:43:9A
Getting Radio Node Time
No Response from Radio Node. Retrying
Got GG59351504230206

Set DOS Date/Time to Mon Dec 11 17:09:53 2006

Closed CommPort
Note: For Initial Config Type X then
UCMD UIPLINK -I00001234 –S192.168.0.101 -P7070 –N101
where  -I = IPLinkID
       -S = Server IPAddr
       -P = Server Port
       -N = Modem Number

AES UIPLink UCMD Version 0.02

C:\>
```

Example 1: Startup Messages (After a Board Reset and pressing X)

Editing files:

You will have to edit file(s) to configure this device to communicate with its assigned MultiNet Receiver. To edit a file, at the "C:\>" prompt key in "edit {filename}<Enter>". {filename} is replaced with the actual name of the file to view or edit.
The following commands are used within the DOS Line Editor:

Enter the number of a line and press enter to edit that specific line.

i:	for insert	"Use this command only and only if a line of the file was missing"
l:	for list	all the lines of the file.
d:	for delete	"Use this command if you typed the wrong info into the file"
s:	for save	after you're done changing the file you must save.
Q:	for quit	to exit the file

C. Configuring the 7170 IP-Link Transceiver:

There is one file that you need to edit in order to configure the 7170 IP-Link Transceiver to communicate with the components in a system. A Setup Menu discussed later will allow setting the rest of the RF and TCP/IP configurations. Listed below are instructions to edit lines within each file that need to be modified. Preceding instructions describe procedure for getting to the command prompt allowing you to run the Editor, which is used to edit these files.

C.1. Edit the WATTCP.CFG file:

The WATTCP.CFG file contains the parameters that configure the IP-Link Transceiver to be connected to the Internet (LAN/ WAN). The file has 3 entries: Static IP or DHCP, Gateway and Net mask of the network where the IP-Link Transceiver will be installed. To view the contents of this file enter at the C prompt "type wattcp.cfg" and you should see something like this:

```
my_ip=192.168.0.11      OR      my_ip=dhcp
gateway=192.168.0.1.
netmask=255.255.255.0
```

Example 2: Contents of the wattcp.cfg file

To edit this file type "edit wattcp.cfg" and enter. You will see the following:

0: my_ip= 192.168.0.11 OR 0: my_ip=dhcp
1: gateway=192.168.0.1
2: netmask=255.255.255.0

Type the line number in the file that you want to replace then <Enter>:
Example, if you want to change line 0 (zero) type 0 and then <Enter>. Next type your new information:

Examples: 0:my_ip=192.168.1.22 or 0: my_ip=dhcp

Once you're done editing the wattcp.cfg file, type L + <Enter> to list the file contents. Then confirm that the 3 lines are correct. Next type S + <Enter> to save and exit.

C.2. Configuring the TCP/IP parameters:

There are two methods you can use to configure the following parameters. The first and preferred method is to access the Setup menu and select menu items for the specific parameter that you wish to modify. The other method, described below involves entering a command line with a number of arguments. The Setup menu method follows in C.3

Reset the IP-Link and press X to get to the C Prompt, and then type the following command replacing example data shown below with your actual required data:

UCMD UIPLINK -I00001234 -S192.168.0.101 -P7070 –N978-555-55555<Enter>
Where: -I = IPLinkID -S = Server IPAddr
-P = Server Port -N = Server's Modem Number

Once you enter the UCMD command, with or without parameters the IP-Link will attempt connecting to your Server.

C.3. Set Up Menu:

There are several methods to access the Setup Menu using a terminal program attached to the Console port.

- One is to reset the IP-Link and press "S" following the prompt:
  "Type **S**etup Key within 3 Sec. For Setup Menu"
- During normal operation, when the Modem is not selected for testing or backup communication, press "S" plus <Enter>.

Once the Menu is displayed you press a selected highlighted letter and then press <Enter> to modify its associated parameter(s) or access the function.

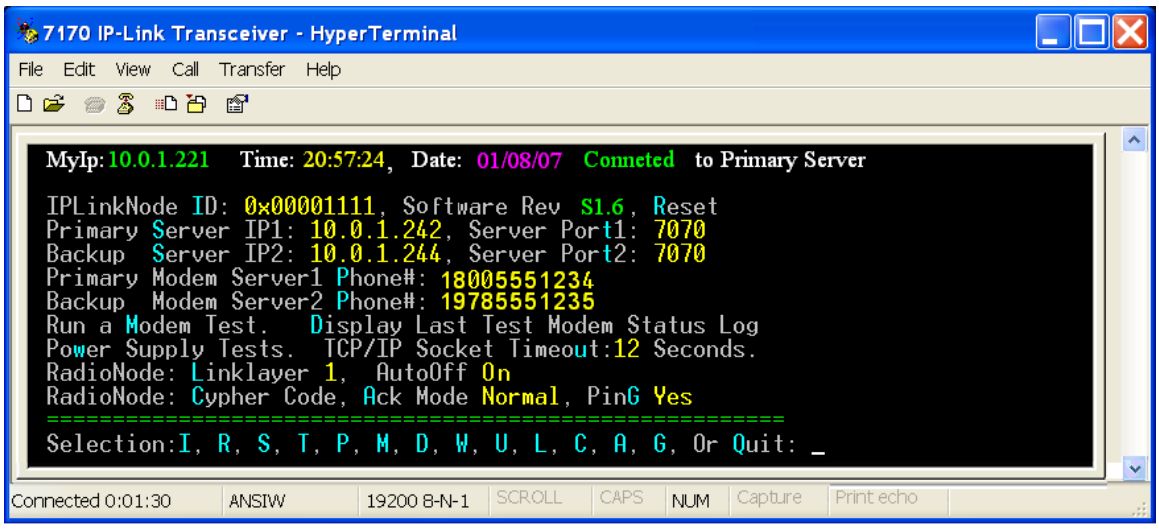

7170 IP-Link Transceiver - HyperTerminal
File Edit View Call Transfer Help
MyIp: 10.0.1.221 Time: 20:57:24, Date: 01/08/07 Conneted to Primary Server
IPLinkNode ID: 0x00001111, Software Rev S1.6, Reset
Primary Server IP1: 10.0.1.242, Server Port1: 7070
Backup Server IP2: 10.0.1.244, Server Port2: 7070
Primary Modem Server1 Phone#: 18005551234
Backup Modem Server2 Phone#: 19785551235
Run a Modem Test. Display Last Test Modem Status Log
Power Supply Tests. TCP/IP Socket Timeout:12 Seconds.
RadioNode: Linklayer 1, AutoOff On
RadioNode: Cypher Code, Ack Mode Normal, PinG Yes
Selection:I, R, S, T, P, M, D, W, U, L, C, A, G, Or Quit: _
Connected 0:01:30 ANSIW 19200 8-N-1 SCROLL CAPS NUM Capture Print echo

Figure P – IP-Link Setup Menu

Functions accessed by pressing I, and Primary Server half of S, T and P are also configurable using the UCMD command mentioned in C.2.

I: Modifies the 8 digit Hexadecimal IPLinkNode ID of which the last four digits is the ID reported for this device. It must be unique in the network. This ID is also passed to the attached RF Board. You must include the leading four zeroes.

R: Resets the IP-Link. There is up to a 70 second delay as the unit waits for the watchdog program to initiate the reset.

S: Modifies Primary Server IP1 and Backup Server IP2 addresses for the Primary and Backup (Secondary) MultiNet Receivers.

T: **"**Server Port1" and "Server Port2" IP port numbers used by the receiver that allows the IP-Link Transceiver to connect. Default is 7070

P: Modifies the "Primary Modem Server1 Phone#" and "Backup Server2 Phone#" numbers that the IP-Link Transceiver will call if TCP/IP fails.
The modem feature has not been evaluated by UL.

M: Forces a test of the modem. Same as is automatically run at program start and daily.

D: Displays a scrollable log with the results of the last modem test.

W: Runs tests on the power supply. Follow prompts on display.

U: TCP/IP Socket Timeout is the time that the unit waits for an ACK for a sent TCP/IP packet. Default is 12. Setting this to greater that 12 seconds will invalidate UL switch over to Backup Modem of 30 seconds. Contact AES Technical support before attempting to modify this value. The modem feature has not been evaluated by UL.

L: Set the Linklayer (Link Layer / Level). If the IP-Link Transceiver is one of the two Local or Remote IP-Links installed to act as the main Primary and Backup units in a radio cloud of Subscribers, set the Link Layer to 1. If it is in the same radio cloud with the two IP-Link Transceiver that are set to 1, you may set the Link Layer to 1 or higher. You must have in an RF region, at least two IP-Links set to Linklayer 1. None can be set to 0. None should be set higher than 4.

A NetCon 6 or Higher is reported to the Alarm Monitoring System when the MultiNet Receiver is using Ademco 685 emulation as an "E354 00 C915"

C: This sets the system Cypher (Cipher) Code. This code is also passed to the attached RF Board and is used to authenticate transmissions by other IntelliNet devices that must use the came cipher code.

A: Set the RF Acknowledgement / Ack Mode. Use 0 for Quick ACK and 1 for Normal ACK. Only one IP-Link Transceiver in a radio cloud should be set to 0 for Quick ACK. Quick ACK means that the IP-Link Transceiver is sending a Packet Acknowledged Packet on the heels of a reception without listening for a clear frequency.

Having two IP-Links in the Quick ACK mode could cause Packet Acknowledgments to be jammed or blocked.

G: PinG - This option when enabled (On), will instruct the IP-Link Transceiver to Monitor RF traffic and report to the MultiNet receiver if it appears to be lost or silent. This must be set to Yes for UL installations and NFPA 72 compliance.

Less than 200 seconds after the frequency goes silent (≈150 Seconds), an RF Test is initiated by the IP-Link to verify its RF operation. This test verifies the RF, IP-Link, Radio, Coaxial Cable, connectors, surge protectors, Antenna and anything else in the transmission line, by transmitting a Poll Test. The test is directed to the ID of the last device for which a transmission was received. A failure to receive an Acknowledgement Packet for the transmitted Test, results in the reporting of an RF failure.

The MultiNet Receiver will generate a code to send to the Alarm Monitoring System or annunciate the RF Failure. The Ademco 685 emulation code will be "E355 00 C906". The message indicating that the RF may be lost will be annunciated at the MultiNet Receiver or transmitted to the Alarm Monitoring System less than 200 seconds after the frequency goes silent.

Q: To Quit menu and return to normal operation.

C.4. Test the network connection:

- From a command prompt, reached by pressing X after a reset you can confirm communication with assigned MultiNet receiver by issuing the command: ping <MultiNetReceiverIPaddress> and looking for successful transmissions and replies. Press <Enter> to stop pinging and get a summary result.
- Press reset in preparation for the next step. Similar to below should scroll on the display of the terminal program.

```
UCMD UIPLINK -I00001111 -S192.168.0.11 -P7070 –N101
AES UIPLink UCMD Version 0.02
Running UIPLink -v
Setting Watchdog 70 Sec

Calculating UIPLINK.exe Checksum Please Wait... Bytes Read 512Bytes Read 1024By
Done We are UIPLINK.exe with a Chksum of 0xF091, File Size 135040
Press Enter for Menu
UIPLink S0.4.4 Startup ChkSum:F091, Size:135040.
Heart Rate = 5 Seconds
IPlinkID = 00000002
Queued[0], Software Version For Server
Initializing TCP/IP Sockets
My IP Address is 192.168.0.11
sendRequest(TT)
Opening 192.168.0.101 on Port 7070
ServerTime&Date Sync. Thu Jan 06 18:10:46 2005
Radio Node Sent Me:↓
sendQueue
sendRequest(TT)
ServerTime&Date Sync. Thu Jan 06 18:10:46 2005
sendRequest(QQC)
sendRequest(QQF)
Sending Packet[0] to Server1
Unknown Reply from Server <10,00,00,00>
Sending Packet[1] to Server1
ACK Received on Packet[1] from EtherNet Server
sendQueue() done.
My UTC Time = GG46101804060005
IPLinkTime 41DD7F26, NodeTime 41DD7F28
Node Time OK.
```

Figure Q – IP-Link Serial Port Output at Startup

9.0 Testing the 7170 IP-Link Transceiver:

There are several functions of the IP-Link Transceiver that can be tested to confirm that it is operating properly. Testing is broken up into parts with focus on increasingly advanced functionality with each part.

A. Test Basic Board Functionality:

The tests in this part are intended to check that there is power to the boards and that they have at least basic functionality.

Testing RF Board Local operation.

1. After performing a power up or Radio Reset the RX, WA, and AL LEDs will come on for about one second during the self-test process.
2. Once self-test is complete, the AL LED will come on steady.

Testing Interface Board Local operation.

The board has two LEDs that indicate the status of the Ethernet link. The LNK LED indicates the status of the Ethernet. When illuminated, the Ethernet Port is receiving the Ethernet 'heartbeat' and is connected to a live network. If this LED is not illuminated, there is a problem with the Ethernet wiring or the network. The ACT LED indicates activity on the network. The LED will flash when a data packet is received or transmitted.

1. If the Ethernet port your IP-Link Transceiver is correctly attached to another functioning Ethernet port there should be activity on the LNK and/or ACT LEDs as indicated above.

B. Test Local Board Functionality with terminal:

The tests in this part check the interaction between each board and the attached terminal.

A terminal connected to the "Serial Input" Port is required to perform testing of the IP-Link Transceiver at the local installed location. Instructions for connecting and configuring a terminal to the IP-Link transceiver can be found in Section 8 "Programming and Setup of the 7170 IP-Link".

Receiving the output on your terminal's display as shown in "Example 1: Startup Messages" confirms most of the basic functionality of the IP-Link Transceiver. Being able to successfully setup the IP-Link Transceiver as discussed in Section 8 confirms functionality and interaction with all the boards.

C. Test RF Signal:

Tests in this part are intended to check the transmission line and components for proper operation and problems. **This is a very important test and should be performed as soon after power up as feasible.** Operating the unit with a faulty transmission line or component could cause damage to electronics in the unit. As a precaution, you could disconnect the dB9 connector from the transceiver inside the IP-Link until this test can be performed.

To test your IP-Link's RF signal you need to connect a power meter or SWR meter in the coax line to read power. As with other tests you need a terminal connected to the "Serial Input" of the IP-Link.

1. With the unit powered, press the Reset button in the IP-Link
2. Type X on the terminal. Should see C:\> prompt.
3. At the C:\> prompt, type IPCOMM<Enter>
4. You will be presented with a menu.
5. Type <Ctrl> + J then two exclamation points "!!" in rapid succession plus <Enter>. You should now have an AES> prompt.
6. At the AES> prompt, type using upper case, TEST 10. This will key the transmitter for 10 seconds showing "KEYING TX…" then a timeout or "DONE." message at the end.
7. During the 10-second transmission record your meter's reading.
8. An SWR reading of less than 3 to 1 is acceptable.
9. If the reading is greater than 3 to 1, then replace the antenna, coax and or coaxial connectors until the reading falls below the acceptable level.
10. <Esc> X
11. Type UCMD<Enter> to restart normal IP-Link functions.

D. Test TCP/IP Communication Functionality:

To test that your TCP/IP configuration works, you can utilize a program called PING, which is included in the on-board PC. You will want to ping the IP address of the new gateway that was entered during setup. Type "ping <gateway IP>" and hit enter, you should get a successful response. If not check your Ethernet connection and with the IT admin to resolve this issue.

E. Test RF Communication Functionality:

The easiest method to locally test RF functionality is to have a programmed AES Subscriber unit with 7041 Hand Held Programmer available. Use the "Display Status" function (<Shft> + <F4>) to determine if your subscriber is connected to the network and most importantly that "RT1: #### contains the ID of the IP-Link Transceiver and that the Link Layer (Level) and NETCON are as expected. Level should be 1 higher than the Link Layer setting in the IP-Link Transceiver.

Contact an operator at the location of the AES Supervising IP-Link Transceiver Station to confirm that signals are coming in from this IP-Link Transceiver. This test of course is also confirming TCP/IP communication or complete end-to-end testing as well.

10.0 Warranty / Service Procedures:

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Ship authorized RA items freight-prepaid to: (call for Return Authorization number)

Repair Services, RA#_____
AES Corporation
285 Newbury Street
Peabody, MA 01960 USA

Warranty Rev date 5/08/06

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